

Claims:

(1) In a shell-and-tube type reactor adapted to circulate a heat medium having a solid point in the range of 50 - 250°C to the outside of the reaction tubes, a method for starting up the reactor characterized by introducing a gas of a temperature in the range of 100 - 400°C into the reaction tubes thereby initiating temperature elevation and then circulating the heat medium in a heated state to the outside of the reaction tubes.

(2) A method according to claim 1, wherein said circulation of the heat medium is started after the temperature of said gas at the outlet of said reactor has reached a level in the range of 150 - 250°C.

(3) A method according to claim 1, wherein said shell-and-tube reactor forms therein a plurality of chambers partitioned with an intermediate tube sheet.

(4) A method according to claim 3, wherein said temperature elevation of the reaction chamber is initiated by introducing the gas at a temperature in the range of 100 - 400°C into the reaction tubes through chambers and then said temperature elevation is continued by circulating the heat medium in all the component chambers to the outside of the reaction tubes.

(5) A method according to claim 3, wherein said temperature elevation of the reaction chamber is initiated by introducing the gas at a temperature in the range of 100 - 400°C into the reaction tubes through chambers and then said temperature elevation is continued by circulating the heat medium in all the component chambers to the outside of the reaction tubes and circulating the heat medium further heated in at least one of the chambers to the outside of the reaction tubes.

(6) A method according to claim 5, wherein the chamber in which the heat medium in the heated state is circulated adjoins the inlet for said gas.

(7) A method according to claim 1, wherein said heat  
5 medium is a niter.

(8) A method for the production of (meth)acrylic acid and/or (meth)acrolein, characterized by supplying a raw material gas to said reactor after the method for starting up the device set forth in any of claims 1 - 7.

10 (9) A reactor system comprising a reactor forming therein a plurality of chambers partitioned with an intermediate tube sheet, means for storing a heat medium led out of said chambers, heating means for heating the heat medium led out of said  
15 storing means, and means for supplying said heat medium heated by said heating means to an elevated temperature to at least one of said chambers, characterized by the fact that said storing mean comprises one tank capable of storing at least part of the heat medium in said component chambers and said tank has a volume smaller than the amount of the heat medium  
20 circulated within the component chambers.

(10) A reactor system according to claim 9, wherein said reactor is possessed of heating means for the gas introduced into the reaction tubes.

(11) A reactor system according to claim 9, wherein the  
25 pipe for introducing the heat medium to the reactor is connected to the reactor from an upper annular conduit of the reactor or from the part at a level higher than said annular conduit.

(12) A reactor system comprising a reactor, means for storing a heat medium led out of said chambers, heating means  
30 for heating the heat medium led out of said storing means, and means for supplying said heat medium heated by said heating means to an elevated temperature to at least one of said

chambers, characterized by the fact that said storing means comprises one tank capable of storing at least part of the heat medium in said component chambers, said tank has a volume smaller than the amount of the heat medium circulated within the component chambers, and a pipe for introducing the heat medium into the reactor is connected to the reactor from an upper annular conduit of said reactor or from the part at a level higher than said annular conduit.

(13) A reactor system according to claim 9 which is intended to produce (meth)acrylic acid and/or (meth)acrolein.

(14) A reactor system according to claim 12 which is intended to produce (meth)acrylic acid and/or (meth)acrolein.